

#### § 572.74

measured at the center of the accelerometer specified in § 572.21, Figure 15.

(3) Decelerate the pendulum to a stop with an acceleration-time pulse described as follows:

(i) Establish 5g and 20g levels on the a-t curve.

(ii) Establish  $t_1$  at the point where the rising a-t curve first crosses the 5g level;  $t_2$  at the point where the rising a-t curve first crosses the 20g level;  $t_3$  at the point where the decaying a-t curve last crosses the 20g level; and  $t_4$  at the point where the decaying a-t curve first crosses the 5g level.

(iii)  $t_2 - t_1$  shall not be more than 3 milliseconds.

(iv)  $t_3 - t_2$  shall not be more than 22 milliseconds, and not less than 19 milliseconds.

(v)  $t_4 - t_3$  shall not be more than 6 milliseconds.

(vi) The average deceleration between  $t_2$  and  $t_3$  shall not be more than 26g, or less than 22g.

(4) Allow the neck to flex without the head or neck contacting any object other than the pendulum arm.

(5) Allow at least 60 minutes between successive tests.

[56 FR 57836, Nov. 14, 1991, as amended at 57 FR 4086, Feb. 3, 1992]

#### § 572.74 Thorax assembly and test procedure.

(a) *Thorax assembly.* The thorax consists of the part of the torso assembly designated as SA 106C 030 on drawing SA 106C 001, sheet 2, Revision A, and conforms to each applicable drawing on SA 106C 001 sheet 10, Revision C (including Drawing number 6C-1610-1 thru -4, Revision A, titled "Screw Button Head Socket", dated September 30, 1996, and Drawing number 6C-1021, Revision B, titled "Ballast, 6 Yr. Thorax (for 7267A)", dated September 24, 1996), and sheet 11, Revision D (including Drawing number SA 6C-909, Revision A, titled "Cover-chest Accelerometer", dated September 21, 1996, and Drawing number 6C-1000-1, Revision C, titled "Sternum Thoracic Weld Ass'y.", dated September 24, 1996).

(b) *Thorax assembly requirements.* When the thorax is impacted by a test probe conforming to § 572.77(a) to  $20 \pm 0.3$  fps according to the test procedure in paragraph (c) of this section, the peak

#### 49 CFR Ch. V (10-1-03 Edition)

resultant accelerations at the accelerometers mounted in the chest cavity according to § 572.77(c) shall not be less than 43g and not more than 53g.

(1) The recorded acceleration-time curve for this test shall be unimodal at or above the 30g level, and shall lie at or above that level for an interval not less than 4 milliseconds and not more than 6 milliseconds.

(2) The lateral accelerations shall not exceed 5g.

(c) *Thorax test procedure.* The test procedure for the thorax is as follows:

(1) Seat and orient the dummy on a seating surface without back support as specified in § 572.78(c), and adjust the joints of the limbs at any setting (between 1g and 2g) which just supports the limbs' weight when the limbs are extended horizontally and forward, parallel to the midsagittal plane.

(2) Establish the impact point at the chest midsagittal plane so that the impact point is 2.25 inches below the longitudinal center of the clavicle retainer screw, and adjust the dummy so that the plane that bisects the No. 3 rib into upper and lower halves is horizontal  $\pm 1$  degree.

(3) Place the longitudinal center line of the test probe so that it coincides with the designated impact point, and align the test probe so that at impact, the probe's longitudinal center line coincides (within 2 degrees) with the line formed at the intersection of the horizontal and midsagittal planes and passing through the designated impact point.

(4) Impact the thorax with the test probe so that at the moment of contact the probe's longitudinal center line falls within 2 degrees of a horizontal line in the dummy's midsagittal plane.

(5) Guide the test probe during impact so that there is no significant lateral, vertical, or rotational movement.

(6) Allow at least 30 minutes between successive tests.

[56 FR 57836, Nov. 14, 1991, as amended at 60 FR 2897, Jan. 12, 1995; 62 FR 44227, Aug. 20, 1997]

#### § 572.75 Lumbar spine, abdomen, and pelvis assembly and test procedure.

(a) *Lumbar spine, abdomen, and pelvis assembly.* The lumbar spine, abdomen, and pelvis consist of the part of the

torso assembly designated as SA 106C 50 and 60 on drawing SA 106C 001, sheet 2, and conform to each applicable drawing listed on SA 106C 001, sheets 12 and 13.

(b) *Lumbar spine, abdomen, and pelvis assembly response requirements.* When the lumbar spine is subjected to a force continuously applied according to the test procedure set out in paragraph (c) of this section, the lumbar spine assembly shall—

(1) Flex by an amount that permits the rigid thoracic spine to rotate from the torso's initial position, as defined in (c)(3), by 40 degrees at a force level of not less than 46 pounds and not more than 52 pounds, and

(2) Straighten upon removal of the force to within 5 degrees of its initial position when the force is removed.

(c) *Lumbar spine, abdomen, and pelvis test procedure.* The test procedure for the lumbar spine, abdomen, and pelvis is as follows:

(1) Remove the dummy's head-neck assembly, arms, and lower legs, clean and dry all component surfaces, and seat the dummy upright on a seat as specified in Figure 42.

(2) Adjust the dummy by—

(i) Tightening the femur ballflange screws at each hip socket joint to 50 inch-pounds torque;

(ii) Attaching the pelvis to the seating surface by a bolt D/605 as shown in Figure 42.

(iii) Attaching the upper legs at the knee joints by the attachments shown in drawing Figure 42.

(iv) Tightening the mountings so that the pelvis-lumbar joining surface is horizontal; and

(v) Removing the head and neck, and installing a cylindrical aluminum adapter (neck adapter) of 2.0 inches diameter and 2.60 inches length as shown in Figure 42.

(3) The initial position of the dummy's torso is defined by the plane formed by the rear surfaces of the shoulders and buttocks which is three to seven degrees forward of the transverse vertical plane.

(4) Flex the thorax forward 50 degrees and then rearward as necessary to return the dummy to its initial torso position, unsupported by external means.

(5) Apply a forward pull force in the midsagittal plane at the top of the neck adapter so that when the lumbar spine flexion is 40 degrees, the applied force is perpendicular to the thoracic spine box.

(i) Apply the force at any torso deflection rate between 0.5 and 1.5 degrees per second, up to 40 degrees of flexion.

(ii) For 10 seconds, continue to apply a force sufficient to maintain 40 degrees of flexion, and record the highest applied force during the 10 second period.

(iii) Release all force as rapidly as possible, and measure the return angle 3 minutes after the release.

**§ 572.76 Limbs assembly and test procedure.**

(a) *Limbs assembly.* The limbs consist of the assemblies designated as SA 106C 041, SA 106C 042, SA 106C 071, and SA 106C 072, on drawing No. SA 106C 001, sheet 2, and conform to each applicable drawing listed on SA 106C 001, sheets 14 through 17.

(b) *Limbs assembly impact response requirement.* When each knee is impacted at  $7.0 \pm 0.1$  fps, according to paragraph (c) of this section, the maximum force on the femur shall not be more than 1060 pounds and not less than 780 pounds, with a duration above 400 pounds of not less than 0.8 milliseconds.

(c) *Limbs test procedure.* The test procedure for the limbs is as follows:

(1) Seat and orient the dummy without back support on a seating surface that is  $11 \pm 0.2$  inches above a horizontal (floor) surface as specified in § 572.78(c).

(i) Orient the dummy as specified in Figure 43 with the hip joint adjustment at any setting between 1g and 2g.

(ii) Place the dummy legs in a plane parallel to the dummy's midsagittal plane with the knee pivot center line perpendicular to the dummy's midsagittal plane, and with the feet flat on the horizontal (floor) surface.

(iii) Adjust the feet and lower legs until the line between the midpoint of each knee pivot and each ankle pivot is within 2 degrees of the vertical.

(2) If necessary, reposition the dummy so that at the level one inch below the seating surface, the rearmost